R/V *Roger Revelle* Midlife Refit Update

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Overarching mandate: ONR

AGOR 23 Class Service Life Extension Program

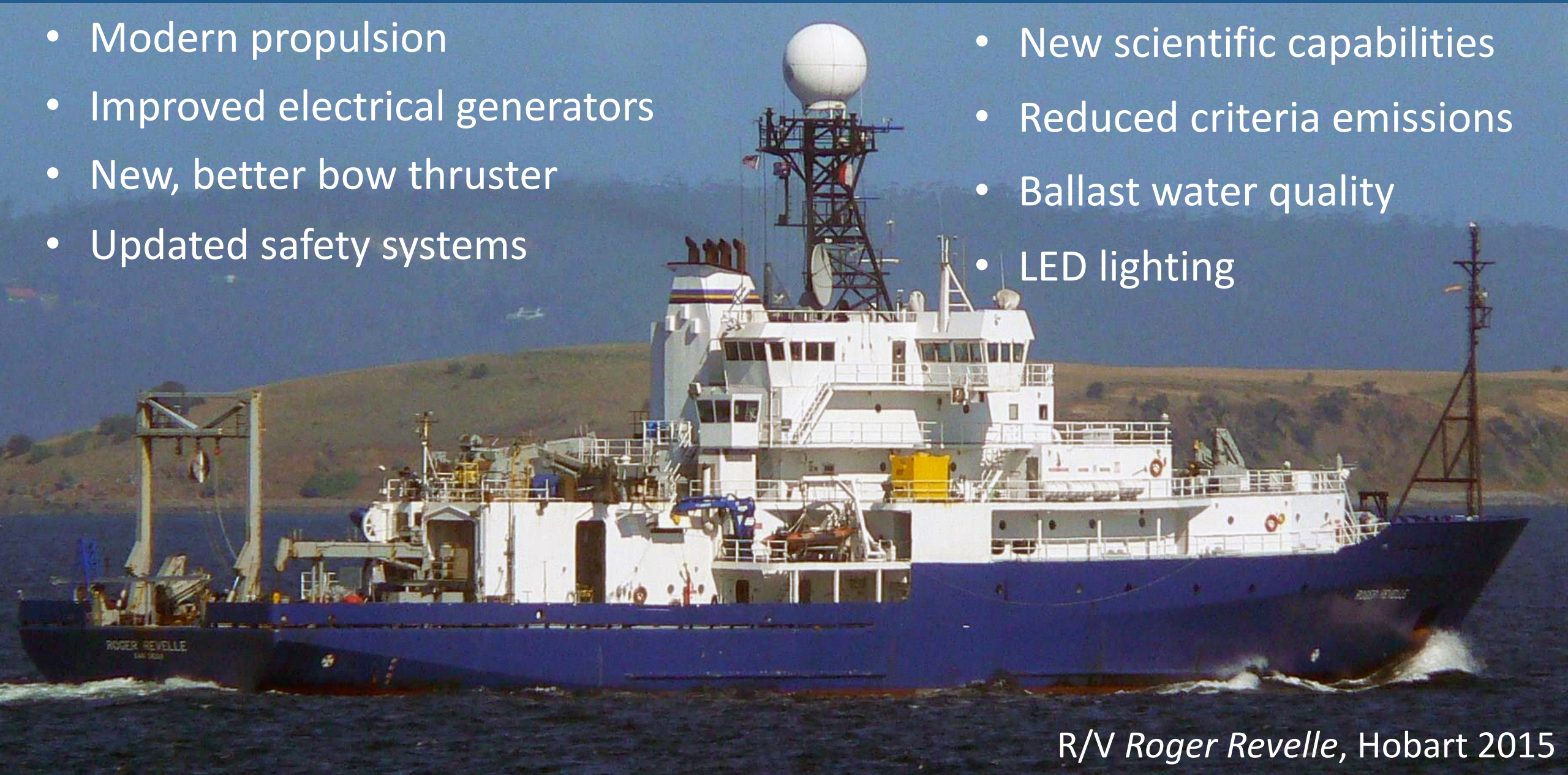
The Global Class ships *Thompson G. Thompson* (1992), *Roger Revelle* (1996), and *Atlantis* (1997) had a 30 year design life

- ONR is focused **primarily on life extension** of the basic ship (hull, mechanical, electrical) – extending the 30 year service life to 45 years
- Ensuring reliability, maintainability and regulatory compliance are key parts of the primary goal
- Science upgrades, making ships green are **secondary goals**

Good Intentions: *Roger Revelle* Midlife Refit

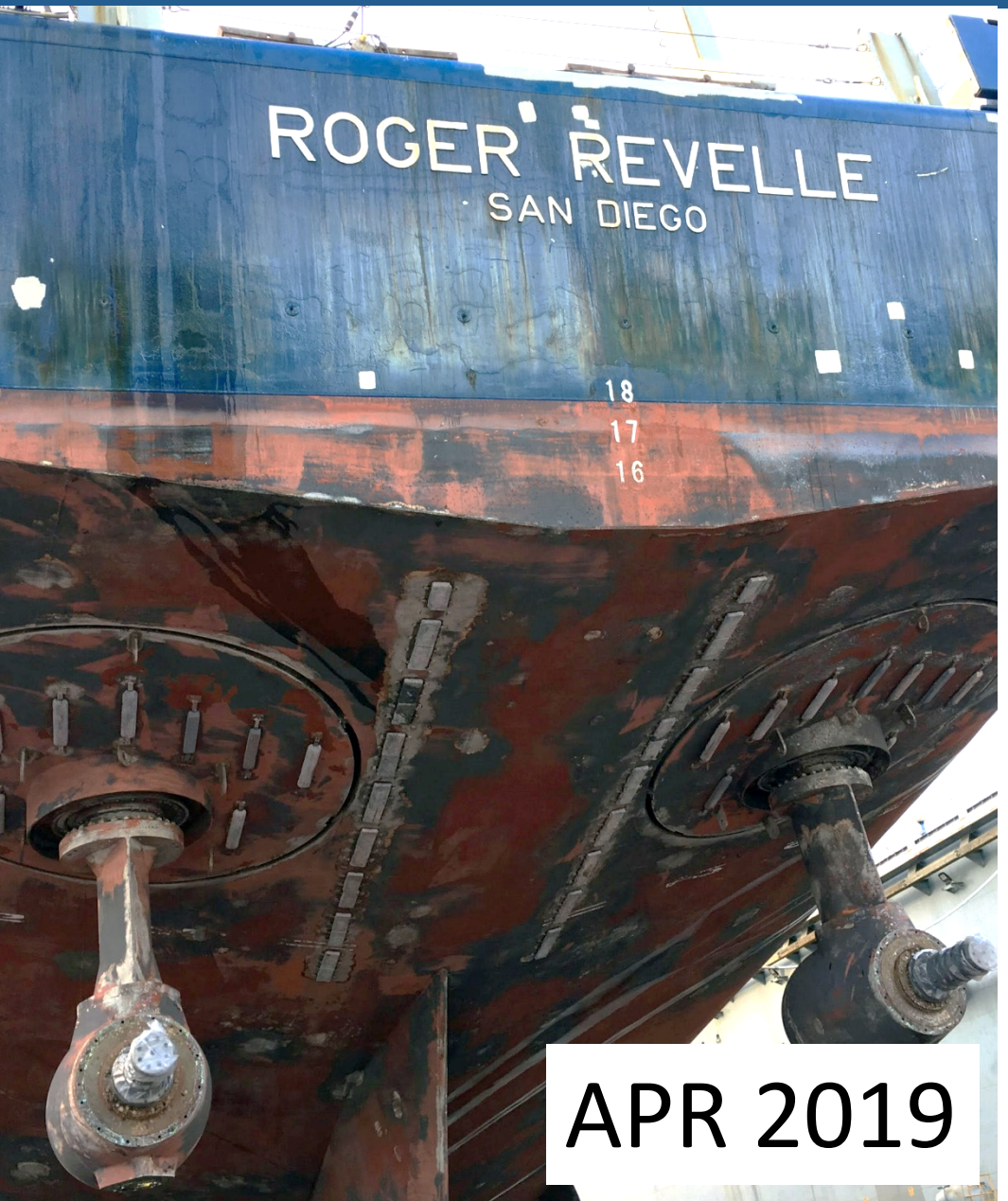
- Modern propulsion
- Improved electrical generators
- New, better bow thruster
- Updated safety systems

- New scientific capabilities
- Reduced criteria emissions
- Ballast water quality
- LED lighting



R/V *Roger Revelle*, Hobart 2015

Schedule: R/V *Roger Revelle* Midlife



APR 2019

One Year
(366 days)

APR 2020

Schedule: R/V *Roger Revelle* Midlife

One Year

(366 days)

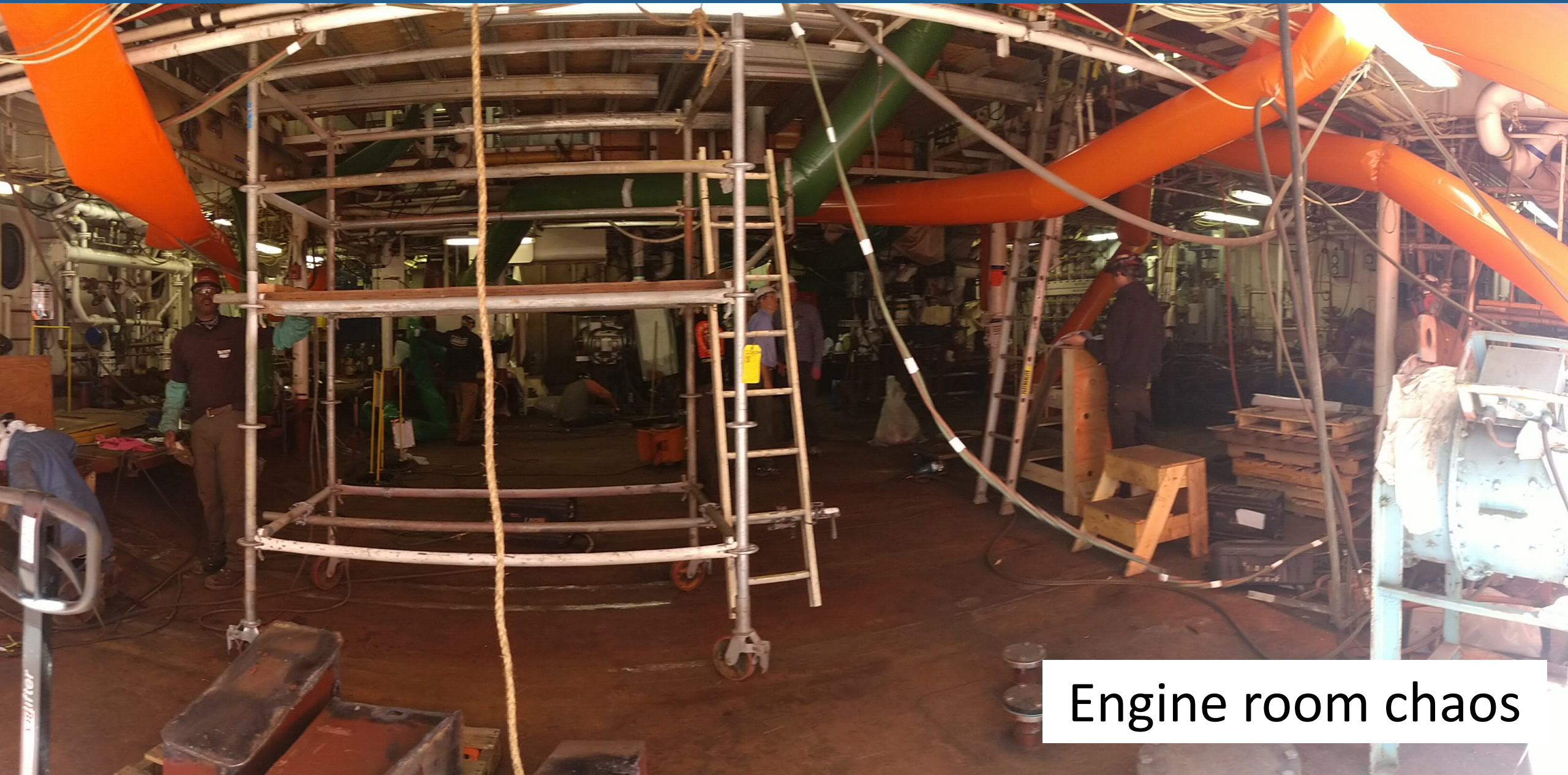
Work Package	
S-01	RR Shipyard Contract Technical Spec
WP-1	Repower
WP-2	Bow Thruster Replacement
WP-5	Z-Drive Inspection and Maintenance
WP-6	Ballast System Piping
WP-7	Ballast Treatment System Installation
WP-8	Firemain System Piping Replacement
WP-9	Potable Water System Modifications
WP-10A	A/C Spaces General
WP-10B	A/C Controls Upgrades
WP-10C	AHU-5 Zone Redesign
WP-10D	Bow Thruster Room A/C
WP-10E	AHU-2 Makeup Air Upgrades
WP-11A	HVAC Makeup Air Upgrades
WP-11B	Generator Room Supply Fan Noise Mitigation
WP-12	Chiller Replacement
WP-13	Sewage System and Drain Replacement
WP-14	Ship Stores Refrigeration Equipment Replace
WP-15	Science Refrigeration System Modifications
WP-16	Uncontaminated Seawater System Modifications
WP-17	PA System
WP-18	Telephone System
WP-23	Ship Service Transformer Upgrades
WP-28	Exterior Ballast and Fuel Tank Vent Modifications
WP-30	Oily Water Separator (OWS) Replacement
WP-32	Crane Replacement
WP-33	Anchor and Chain Maintenance
WP-34	Overhead Lighting Upgrades
WP-35	Steel Replacement
WP-36	Drydocking
WP-37	General Maintenance
WP-38	Multibeam Gondola

Equipment Removals

Engine room hull cut

Bow thruster removal

Dude, where's my ship?



Engine room chaos

Diesel and Generator Rotation Mismatch

Caterpillar diesel engine and Siemens generator each manufactured to run counterclockwise, but no agreement on orientation

This required replacement of generator internal fan

~ Two week schedule delay

#3 Generator Rotor Shaft Damage

#3 generator coupling very hard to remove

Generator shaft found damaged after coupling removed

Not repairable, manufacture replacement 6 months

Multi-Cable Transits / Major Attention

Fire barriers must never be defeated by penetrations.

USCG review every visit.

Network wires in galley

New propulsion cables

Final transits will be fully blocked with conforming material

Removals are complete

Modern Power Is Also Greener

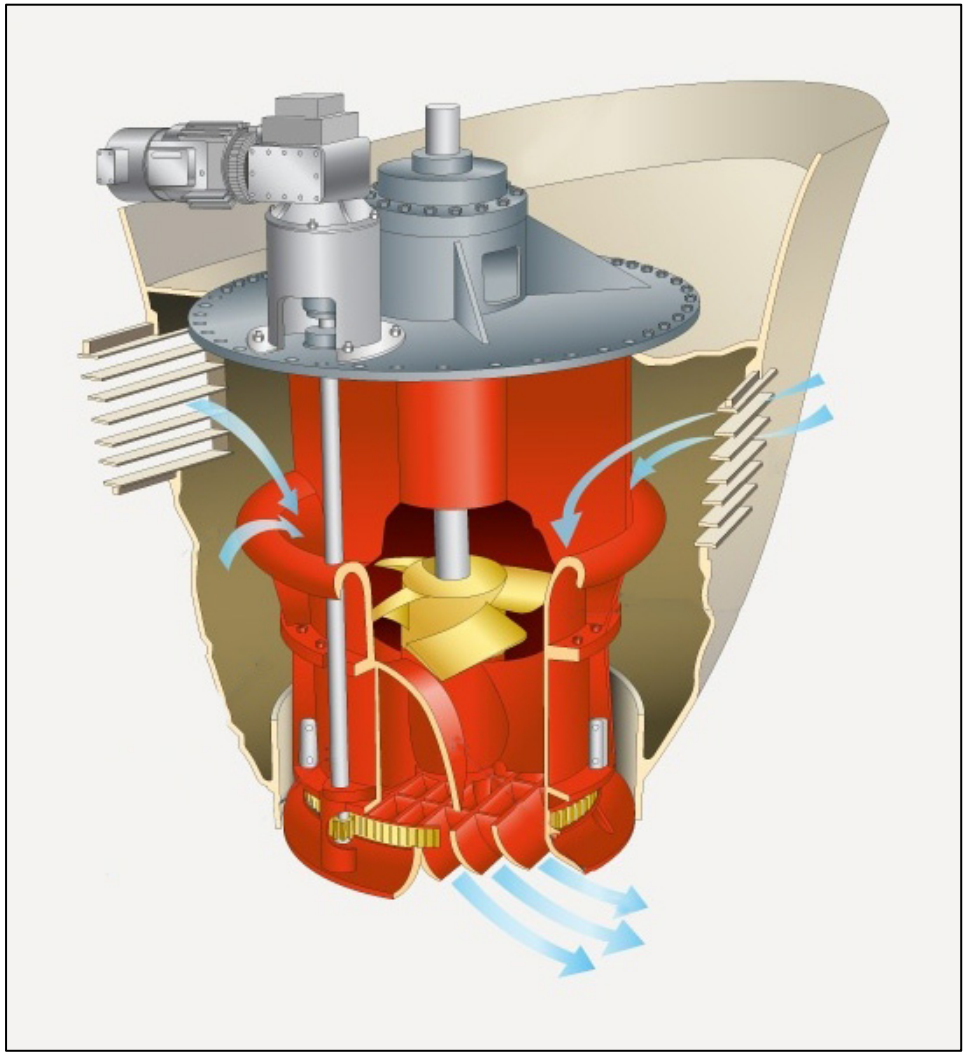
New diesel generator

New clean EPA Tier III diesels replace old Tier I

Reduce emissions from each engine by two-thirds

Bow Thruster

Original equipment: Tees White Gill Model 50T3S



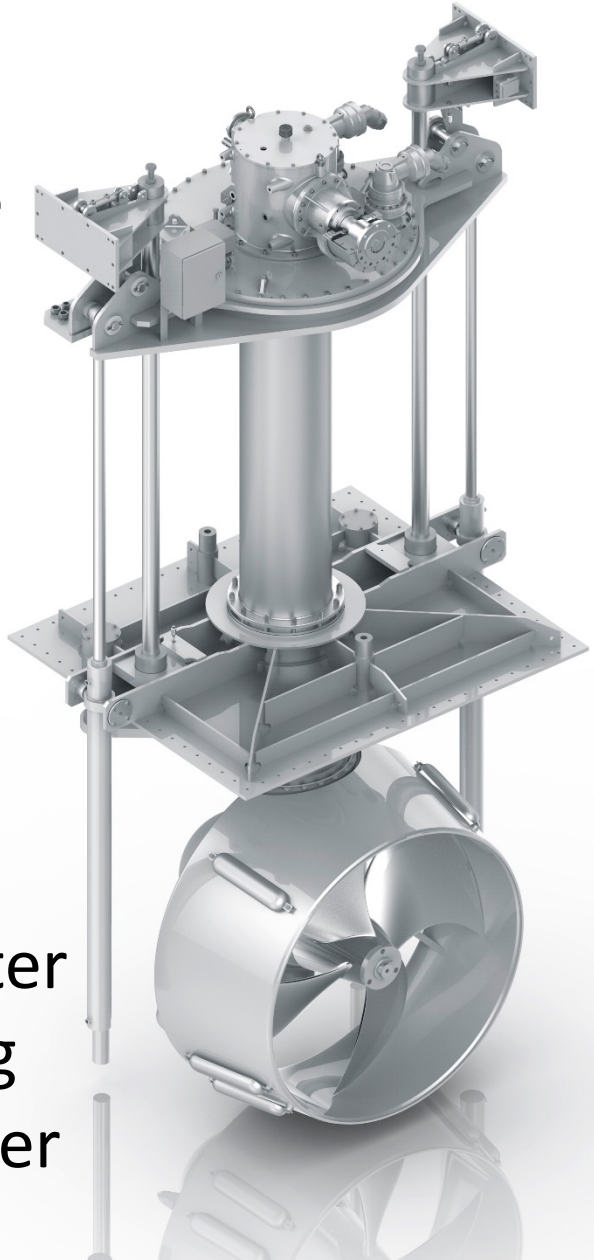
Bow Thruster

New: ZF Marine Retractable L-Drive

Model AT 5011 RT TT-FP

Retracted:
tunnel thruster for maneuvering in port

Extended:
360 degree azimuth thruster
Better dynamic positioning
less prop noise, more power



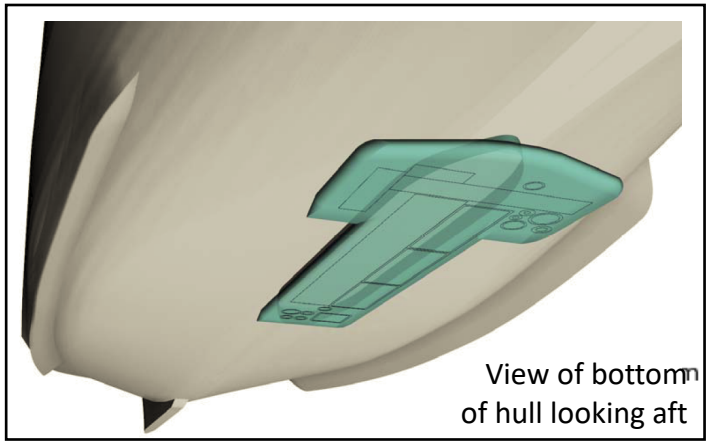
Two New Cranes

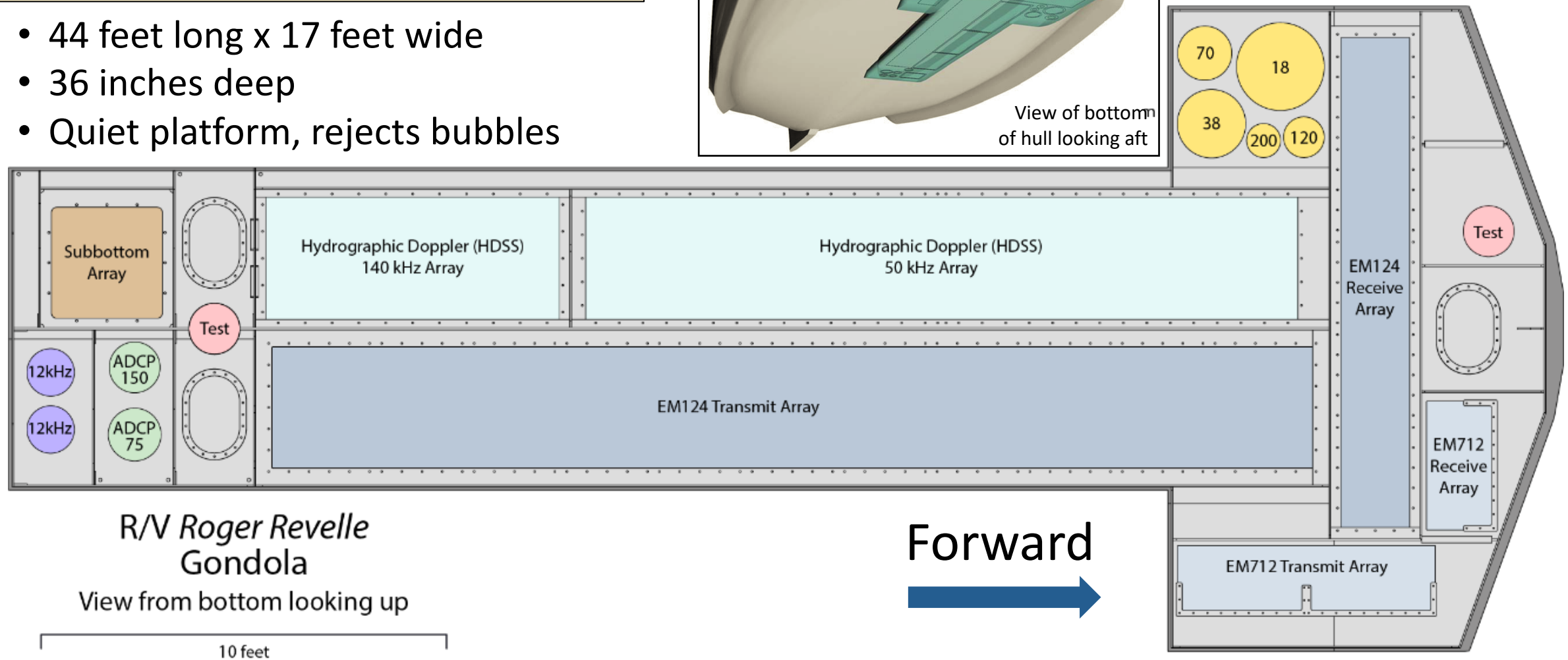
Ballast Water Treatment System: Green

Gondola = Better Sonar Performance

Gondola home for new EM124, EM712, EK80 and HDSS sonars

- 44 feet long x 17 feet wide
- 36 inches deep
- Quiet platform, rejects bubbles





Gondola = Better Sonar Performance

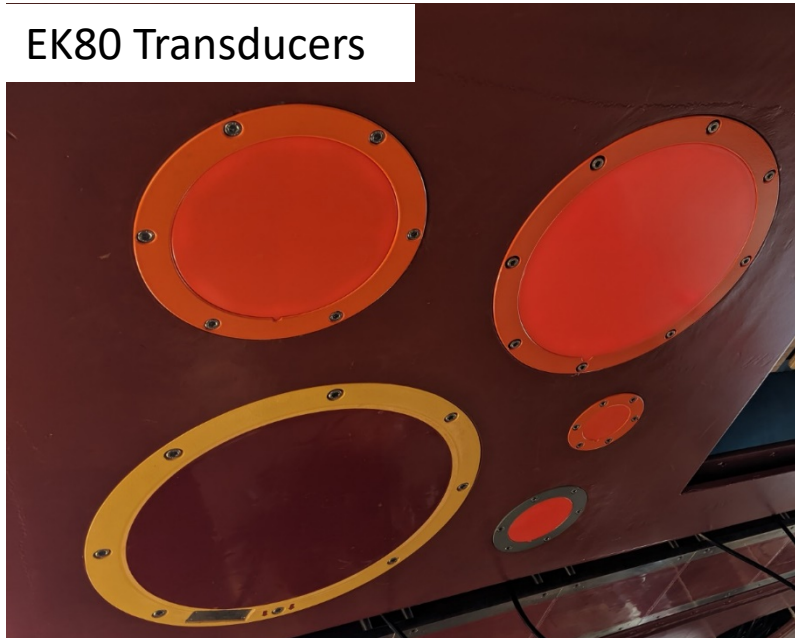
Gondola coming in for landing

HDSS installation

Transducer Installations

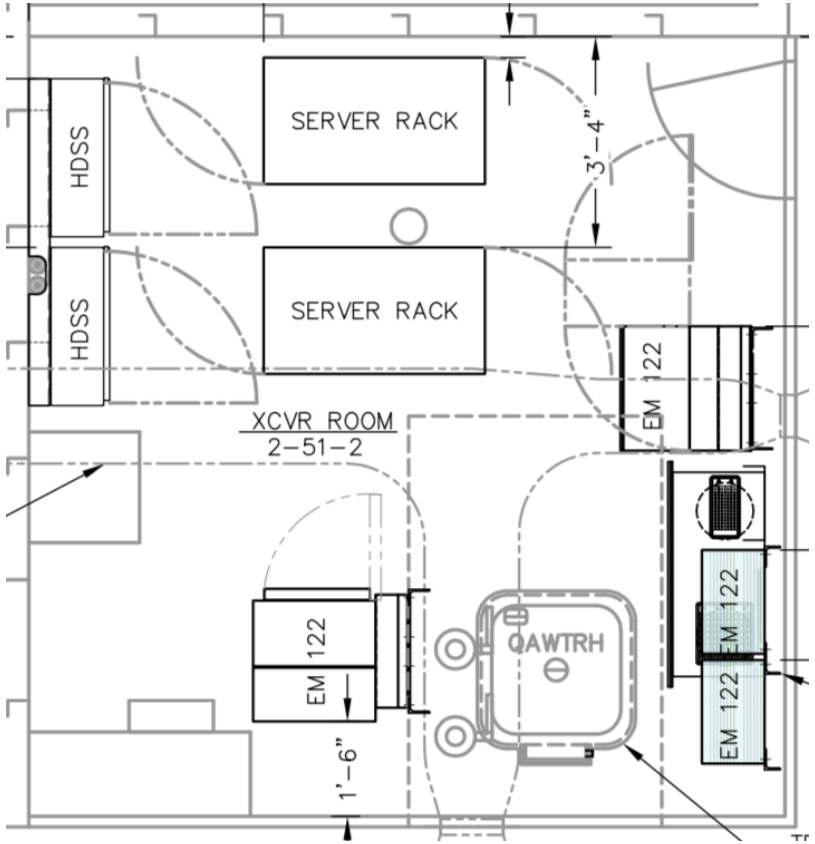
12 kHz

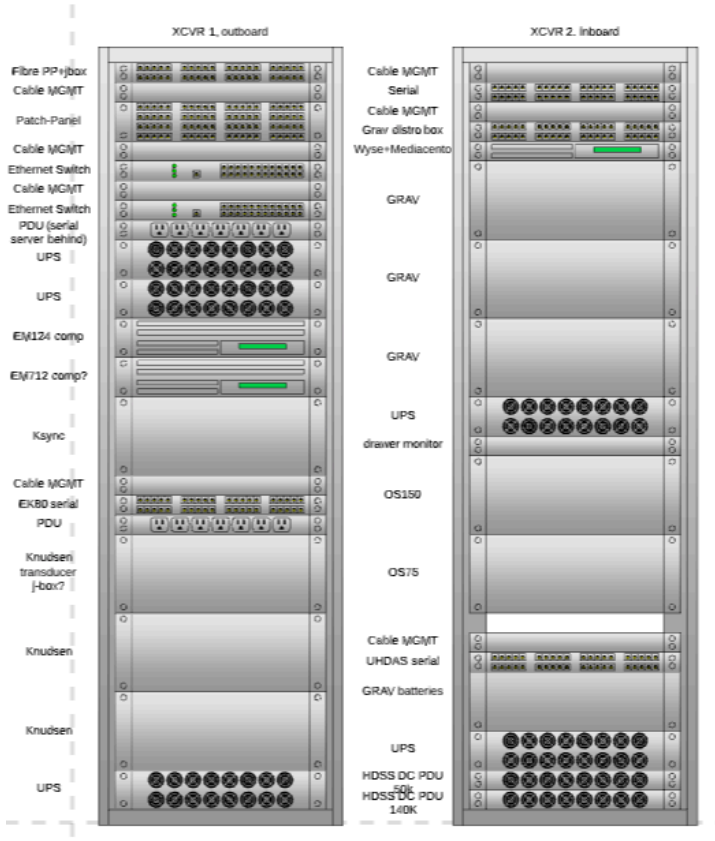
EK80 Transducers



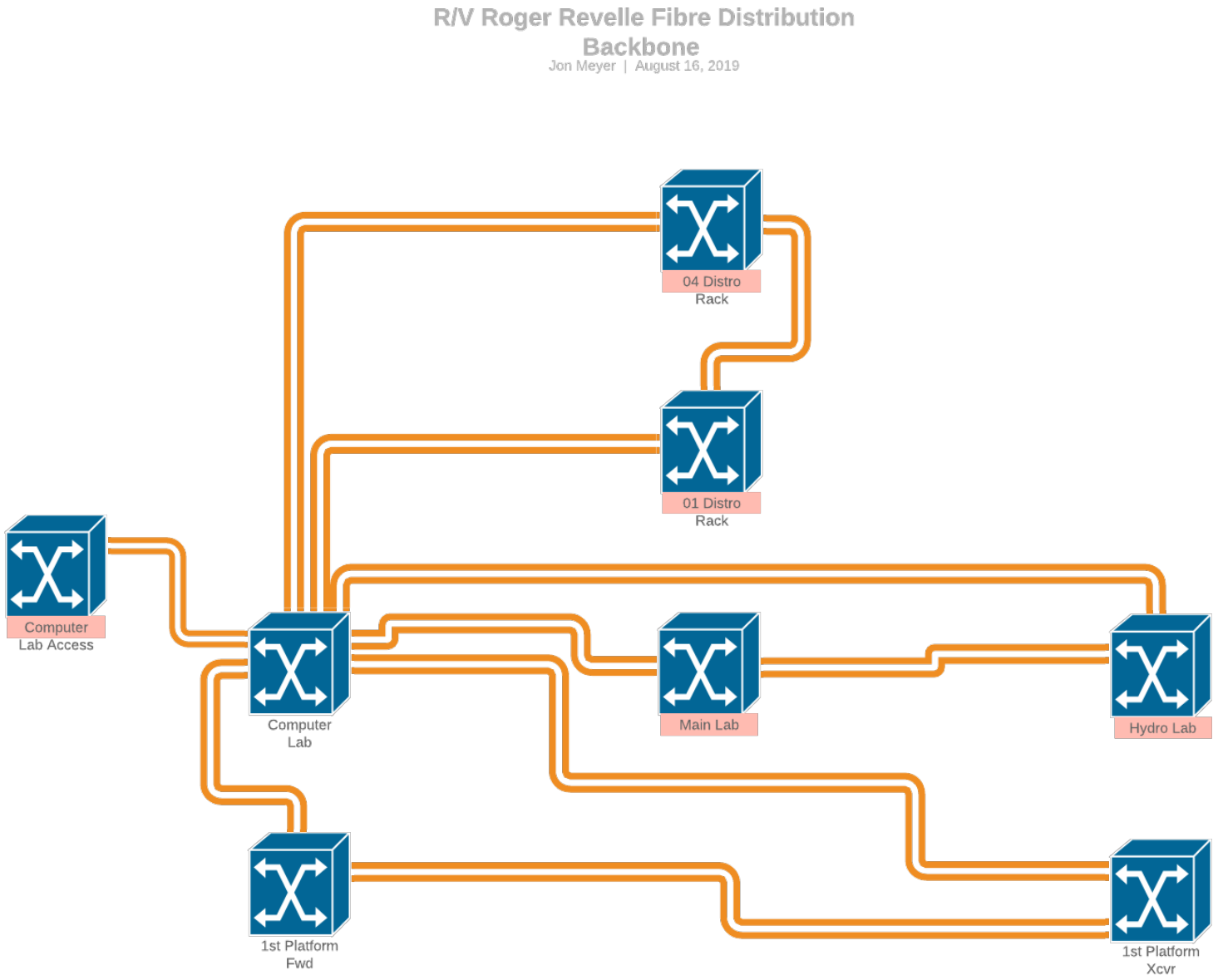
EM124 & EM712

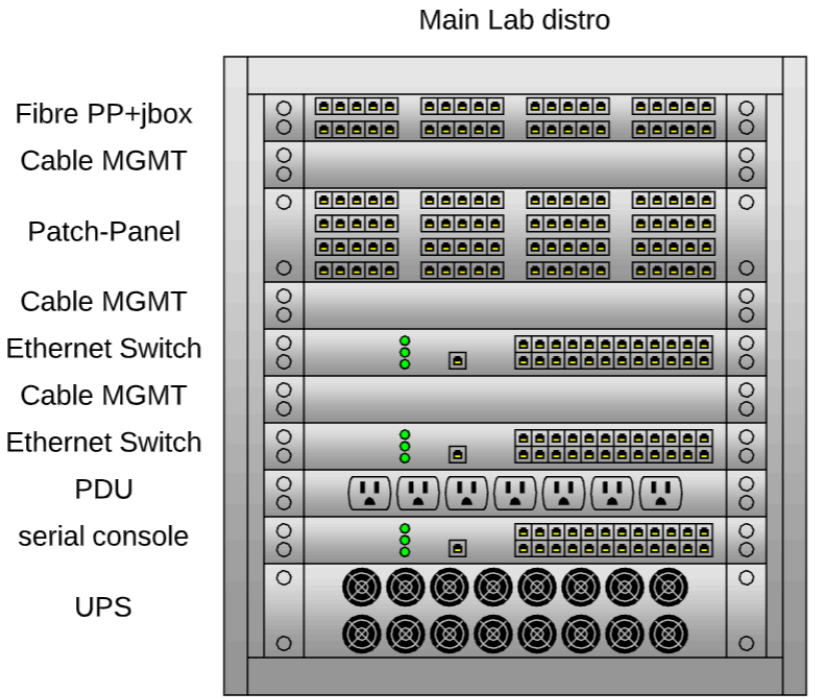
Transceiver Room



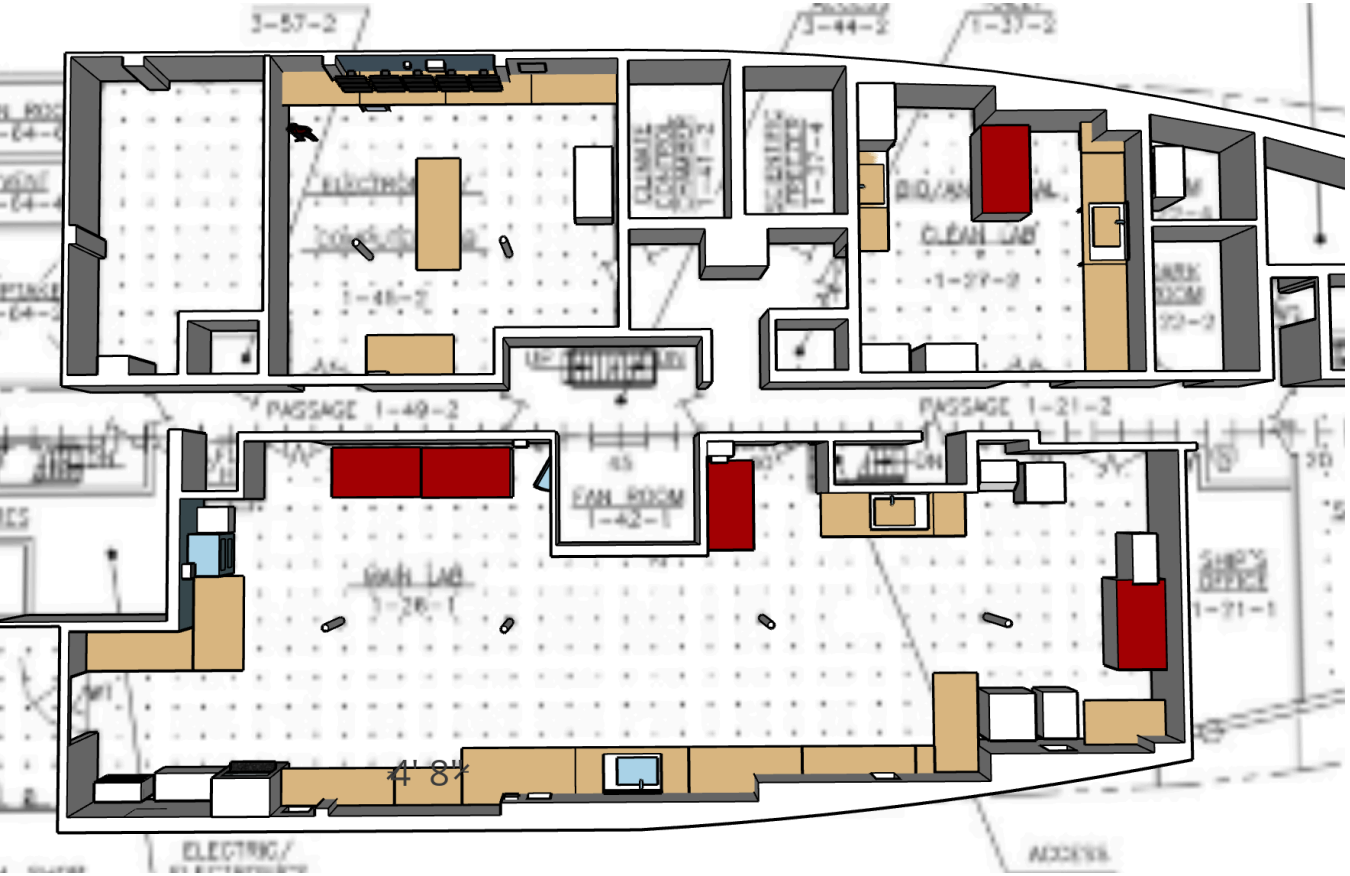


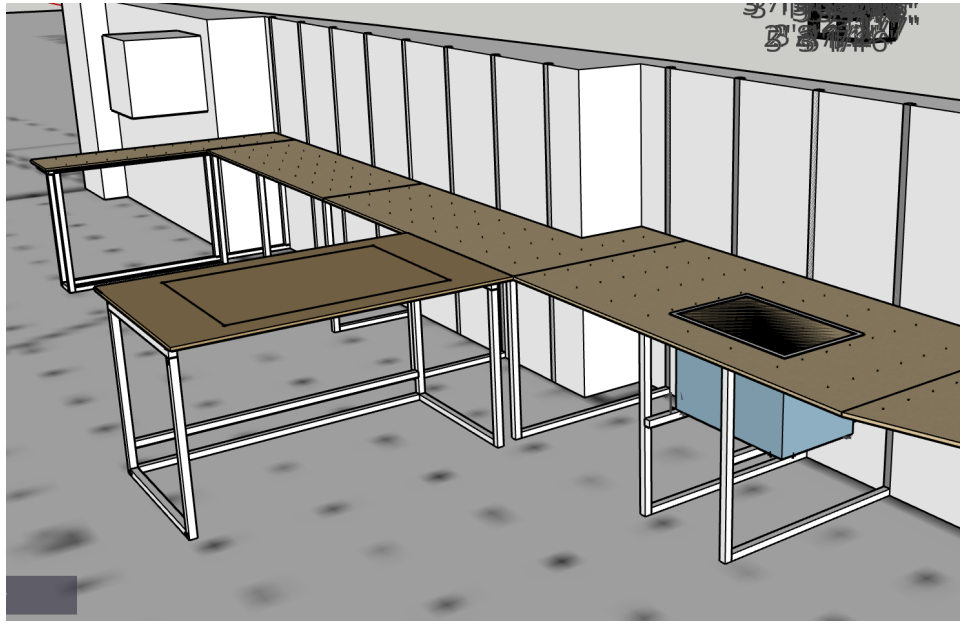
Shipboard Network Replacement





Refurbishment of Lab Spaces





Questions?